Common Sexually Transmitted Diseases: STD 101 for Clinicians

Something for Everyone!

Developed by
John F. Toney, M.D.
Associate Professor of Medicine
Univ. of South Florida College of Medicine
Medical Director, Florida STD/HIV Prevention Training Center
CDC National Network of STD/HIV Prevention Training Centers

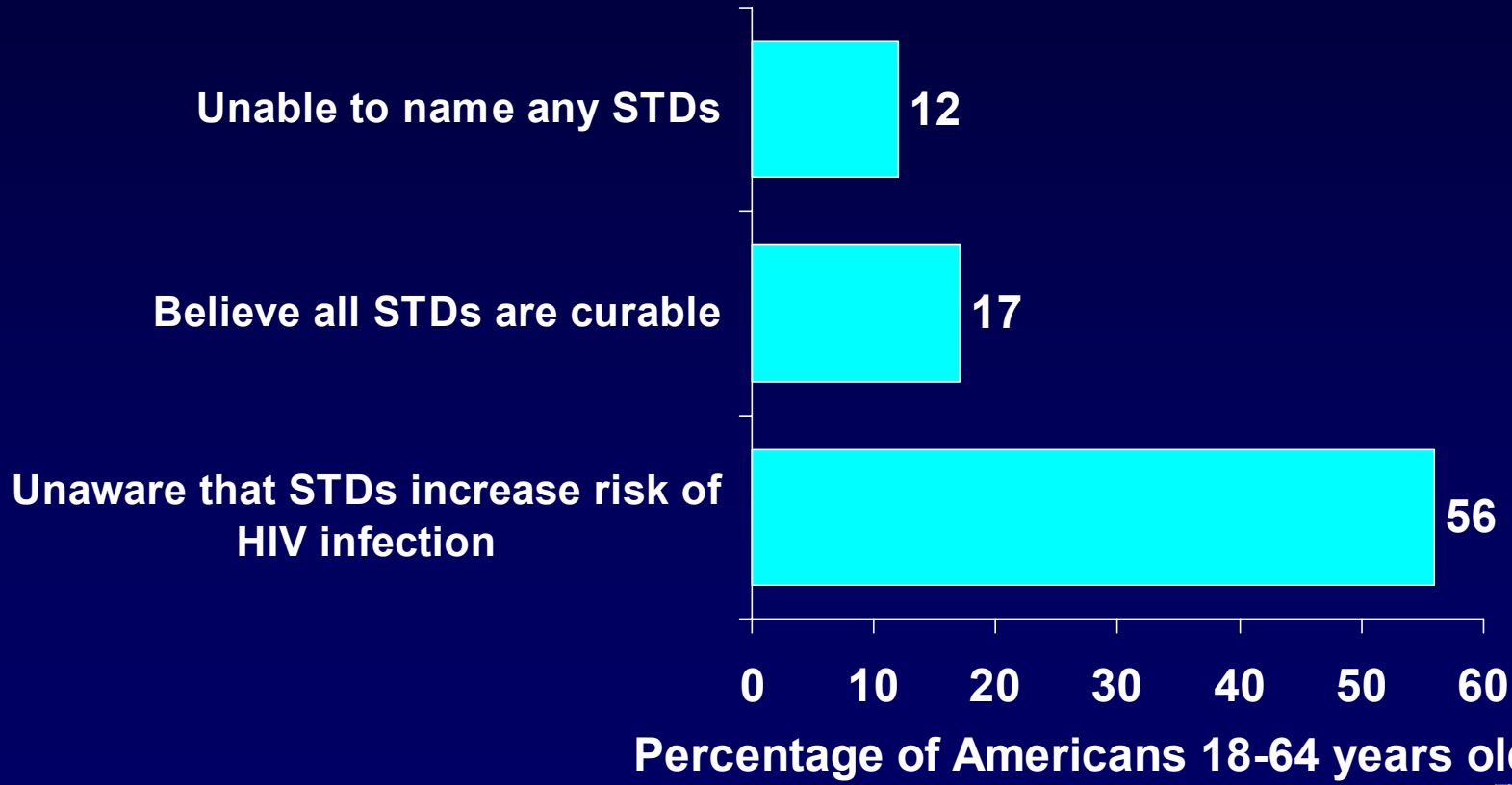
CDC STD Prevention

Topics

- Background Information
- “Sores”
- “Drips”
- Role of STDs in HIV Transmission

Background Information

Knowledge About STDs Among Americans



Source: Kaiser Family Foundation, 1996

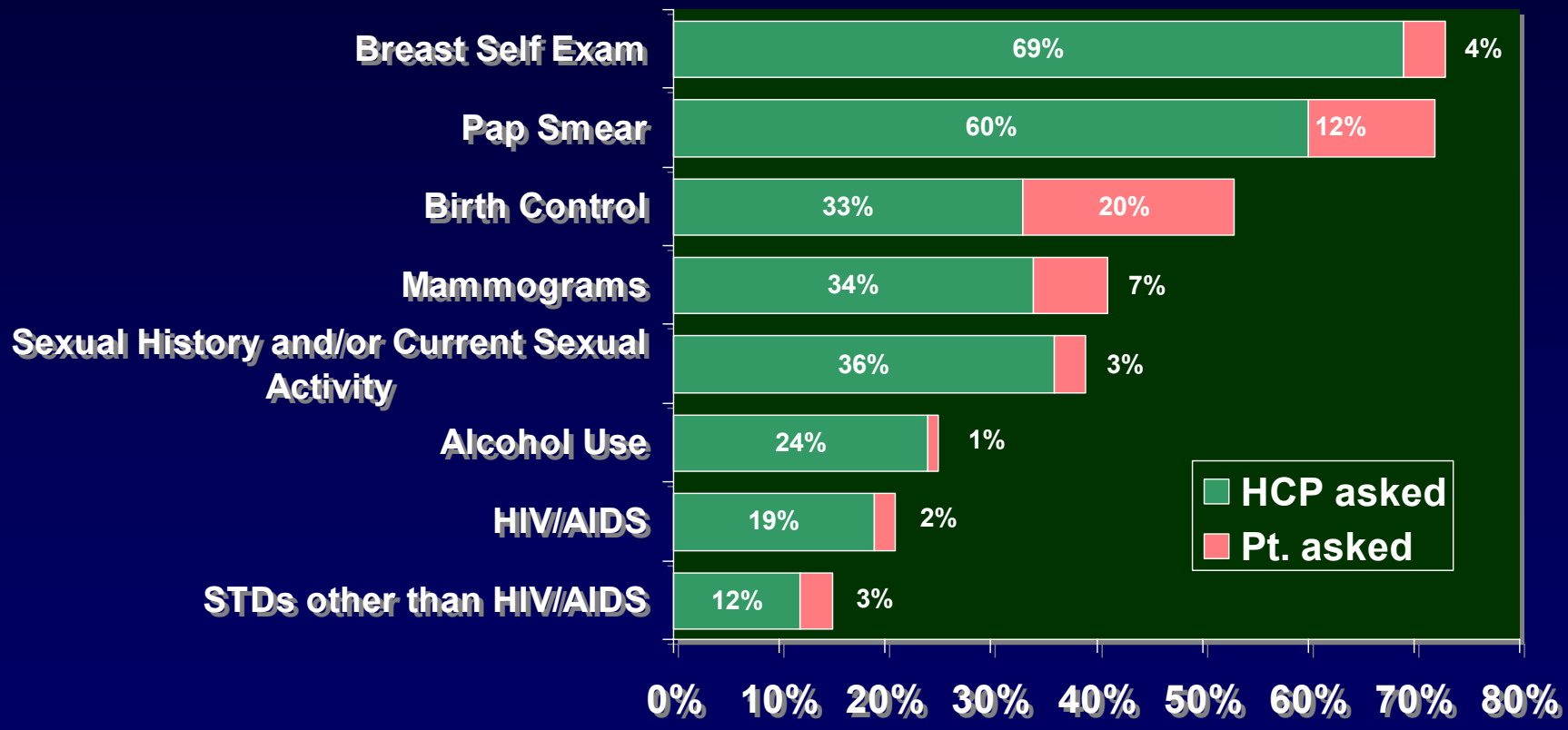
Where Do People Go for STD Treatment?

- Population-based estimates from National Health and Social Life Survey

Private provider	59%
Other clinic	15%
Emergency room	10%
STD clinic	9%
Family planning clinic	7%

Source: Brackbill et al. Where do people go for treatment of sexually transmitted diseases? *Family Planning Perspectives. 31(1):10-5, 1999*

Percent of Women Who Said Topic Was Discussed During First Visit With New Gynecological or Obstetrical Doctor/Health Care Professional



Percentages may not total to 100% because of rounding or respondents answering "Don't know" to the question "Who initiated this conversation?"

Source: Kaiser Family Foundation/Glamour National Survey on STDs, 1997

CDC STD Prevention

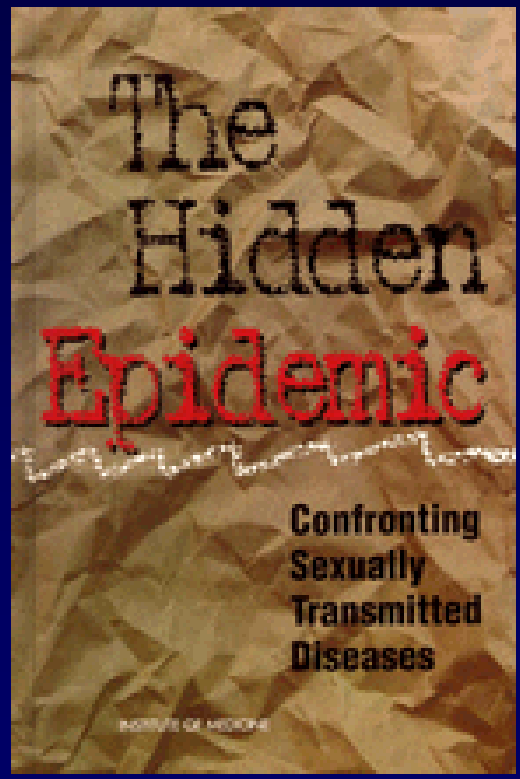
Estimated Burden of STD in U.S. - 1996

STD	Incidence	Prevalence
Chlamydia	3 million	2 million
Gonorrhea	650,000	---
Syphilis	70,000	---
Trichomoniasis	5 million	---
HSV	1 million	45 million
HPV	5.5 million	20 million
Hepatitis B	77,000	750,000
HIV	20,000	560,000

Source: The Tip of the Iceberg: How Big Is the STD Epidemic in the U.S.? Kaiser Family Foundation 1998

"...the scope and impact of the STD epidemic are under-appreciated and the STD epidemic is largely hidden from public discourse."

IOM Report 1997



STDs of Concern

- Actually, all of them
- "Sores" (ulcers)
  - Syphilis
  - Genital herpes (HSV-2, HSV-1)
  - Others uncommon in the U.S.
    - Lymphogranuloma venereum
    - Chancroid
    - Granuloma inguinale

STDs of Concern (continued)

- "Drips" (discharges)
  - Gonorrhea
  - Chlamydia
  - Nongonococcal urethritis / mucopurulent cervicitis
  - Trichomonas vaginitis / urethritis
  - Candidiasis (vulvovaginal, less problems in men)
- Other major concerns
  - Genital HPV (especially type 16, 18) and Cervical Cancer

Bacterial Vaginosis

- Controversy: STD - yes or no
- Need for treatment
  - 1980: only if patient complains
  - 2002: increased risk of:
    - Preterm birth / premature rupture of membranes
    - Amniotic fluid infection
    - Chorioamnionitis / Postpartum endometritis
    - Pelvic inflammatory disease
    - Postsurgical infection
    - Cervical intraepithelial neoplasia
    - Mucopurulent cervicitis
    - Acquisition of HIV infection

"Sores"

Syphilis

Genital Herpes (HSV-2, HSV-1)

Genital Ulcer Diseases – Does It Hurt?

- Painful
  - Chancroid
  - Genital herpes simplex
- Painless
  - Syphilis
  - Lymphogranuloma venereum
  - Granuloma inguinale

Primary Syphilis - Clinical Manifestations

- Incubation: 10-90 days (average 3 weeks)
- Chancre
  - Early: macule/papule → erodes
  - Late: clean based, painless, indurated ulcer with smooth firm borders
  - Unnoticed in 15-30% of patients
  - Resolves in 1-5 weeks
  - HIGHLY INFECTIOUS

Primary Syphilis Chancre

Source: Florida STD/HIV Prevention Training Center

Primary Syphilis

Source: Centers for Disease Control and Prevention

Secondary Syphilis - Clinical Manifestations

- Represents hematogenous dissemination of spirochetes
- Usually 2-8 weeks after chancre appears
- Findings:
  - rash - whole body (includes palms/soles)
  - mucous patches
  - condylomata lata - HIGHLY INFECTIOUS
  - constitutional symptoms
- Sn/Sx resolve in 2-10 weeks

Secondary Syphilis Rash

Source: Florida STD/HIV Prevention Training Center

Secondary Syphilis: Generalized Body Rash

Source: CDC/NCHSTP/Division of STD Prevention, STD Clinical Slides

Secondary Syphilis Rash

Source: Florida STD/HIV Prevention Training Center

Secondary Syphilis Rash

Source: Cincinnati STD/HIV Prevention Training Center

Secondary Syphilis

Source: Diepgen TL, Yihune G et al. Dermatology Online Atlas

Secondary Syphilis – Condylomata Lata

Source: Florida STD/HIV Prevention Training Center

Genital Herpes Simplex - Clinical Manifestations

- Direct contact – may be with asymptomatic shedding
- Primary infection commonly asymptomatic; symptomatic cases sometimes severe, prolonged, systemic manifestations
- Vesicles ⇒ painful ulcerations ⇒ crusting
- Recurrence a potential
- Diagnosis:
  - Culture
  - Serology (Western blot)
  - PCR

Epidemiology of Genital Herpes

- One of the 3 most common STDs, increased 30% from late 70s to early 90s
- 25% of US population by age 35
- HSV-2: 80-90%, HSV-1: 10-20% (majority of infections in some regions)
- Most cases subclinical
- Transmission primarily from subclinical infection
- Complications: neonatal transmission, enhanced HIV transmission, psychosocial issues

Underdiagnosis of Genital Herpes

- 779 women attending STD clinic
- 372 genital herpes diagnosis:
  - 363 HSV-2 antibody positive
  - 9 HSV-1 culture positive lesions
- Of the 372 diagnosed with genital herpes
  - 82 (22%) symptomatic
  - 14 (4%) viral shedding without symptoms
  - 60 (14%) history of symptoms
  - 216 (58%) HSV-2 antibody without viral shedding or history of symptoms

Do Patients Want to Know?

- 92.4% wanted to know if they were infected
- 90.8% wanted to know if their partners were infected
- 65% expected the test as part of STD screening

Source: International Herpes Management Forum, 1999

Genital Herpes Simplex

Source: Diepgen TL, Yihune G et al. Dermatology Online Atlas

Genital Herpes Simplex

Source: CDC/NCHSTP/Division of STD, STD Clinical Slides

Genital Herpes Simplex in Females

Source: Centers for Disease Control and Prevention

CDC STD Prevention

Genital Herpes Simplex

Source: Florida STD/HIV Prevention Training Center

"Drips"

Gonorrhea

Nongonococcal urethritis

Chlamydia

Mucopurulent cervicitis

Trichomonas vaginitis and urethritis

Candidiasis

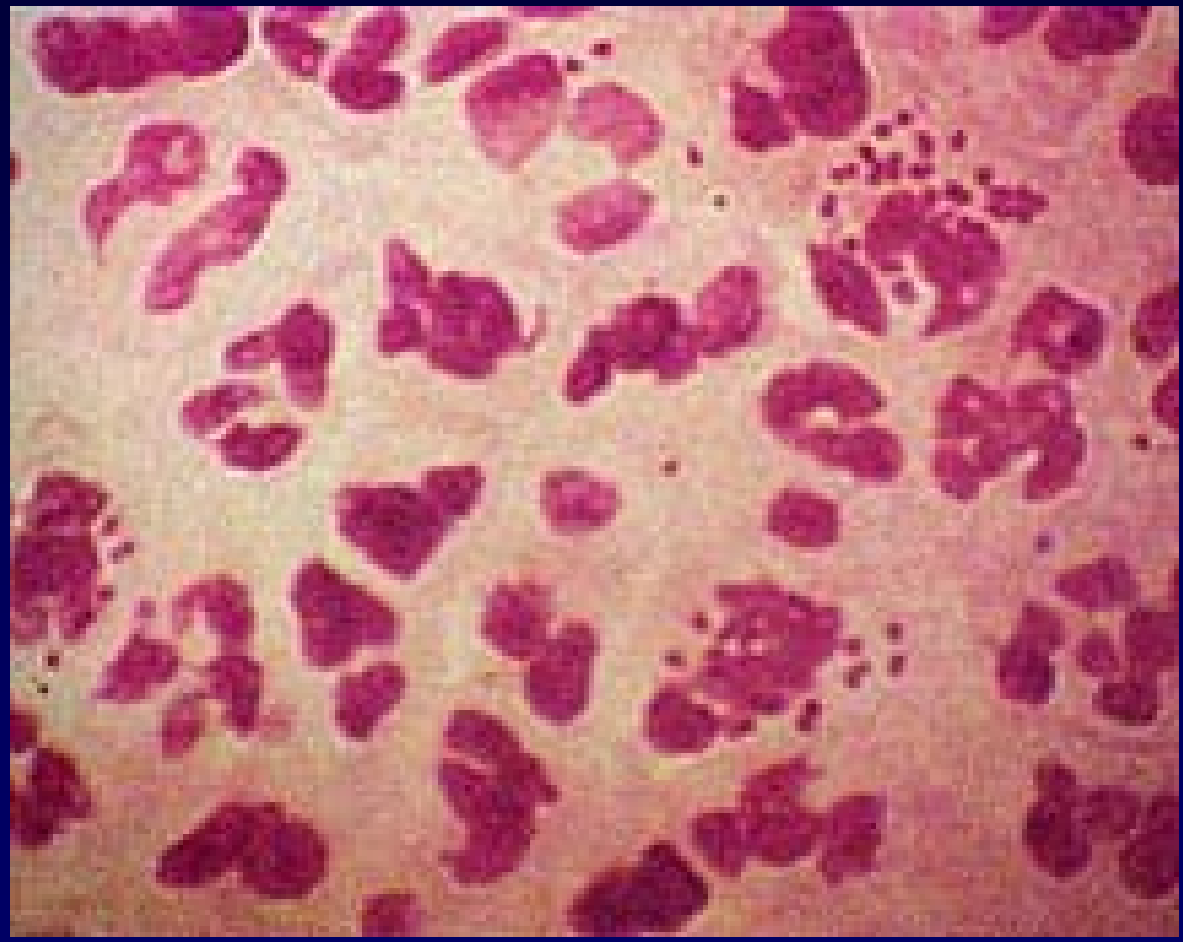
Gonorrhea - Clinical Manifestations

- Urethritis - male
  - Incubation: 1-14 d (usually 2-5 d)
  - Sx: Dysuria and urethral discharge (5% asymptomatic)
  - Dx: Gram stain urethral smear (+) > 98% culture
  - Complications
- Urogenital infection - female
  - Endocervical canal primary site
  - 70-90% also colonize urethra
  - Incubation: unclear; sx usually in l0 d
  - Sx: majority asymptomatic; may have vaginal discharge, dysuria, urination, labial pain/swelling, abd. pain
  - Dx: Gram stain smear (+) 50-70% culture
  - Complications

Gonorrhea

Source: Florida STD/HIV Prevention Training Center

Gonorrhea Gram Stain



Source: Cincinnati STD/HIV Prevention Training Center

Nongonococcal Urethritis

Source: Diepgen TL, Yihune G et al. Dermatology Online Atlas

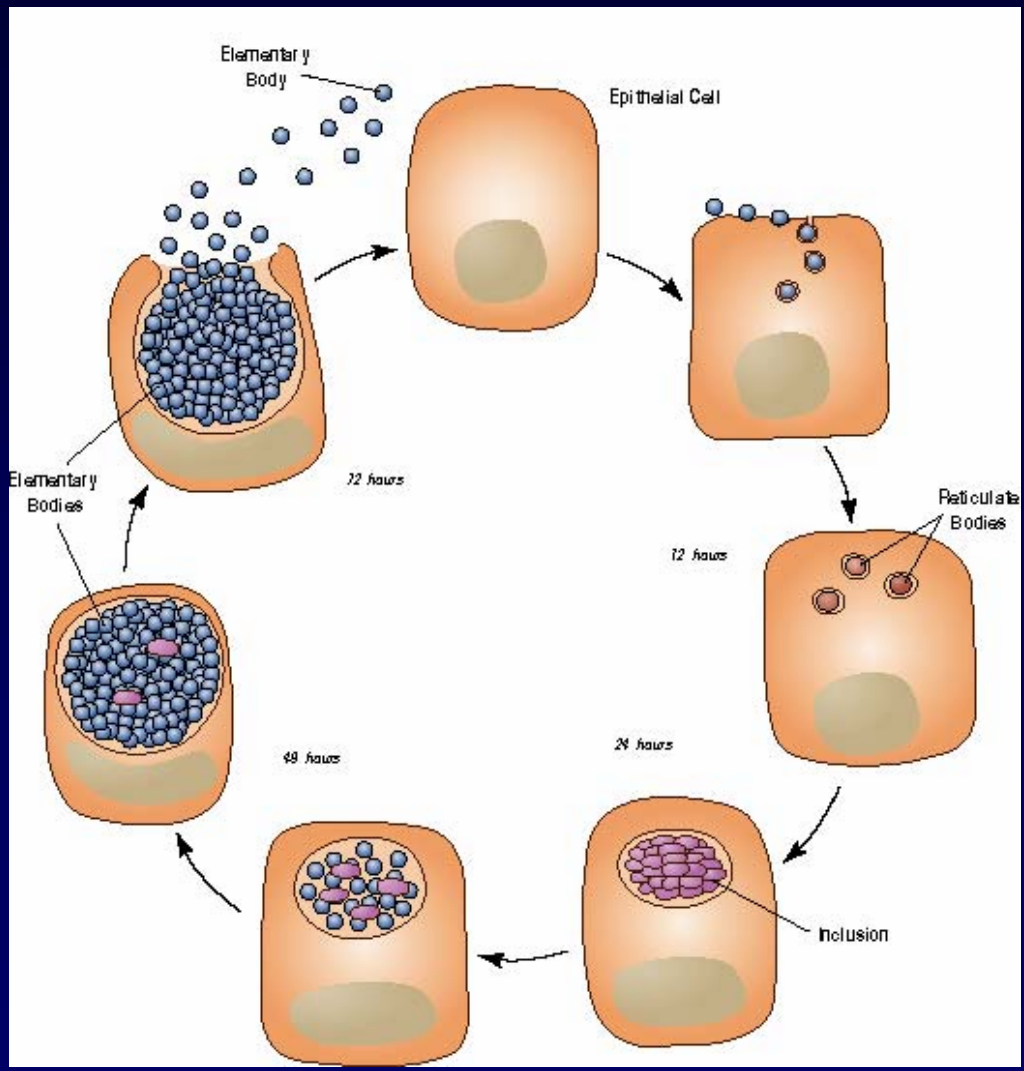
Nongonococcal Urethritis

- Etiology:
  - 20-40% *C. trachomatis*
  - 20-30% genital mycoplasmas (*Ureaplasma urealyticum, Mycoplasma genitalium*)
  - Occasional *Trichomonas vaginalis*, HSV
  - Unknown in ~50% cases
- Sx: Mild dysuria, mucoid discharge
- Dx: Urethral smear ≥ 5 PMNs (usually ≥15)/OI field

  Urine microscopic ≥ 10 PMNs/HPF

  Leukocyte esterase (+)

Chlamydia Life Cycle



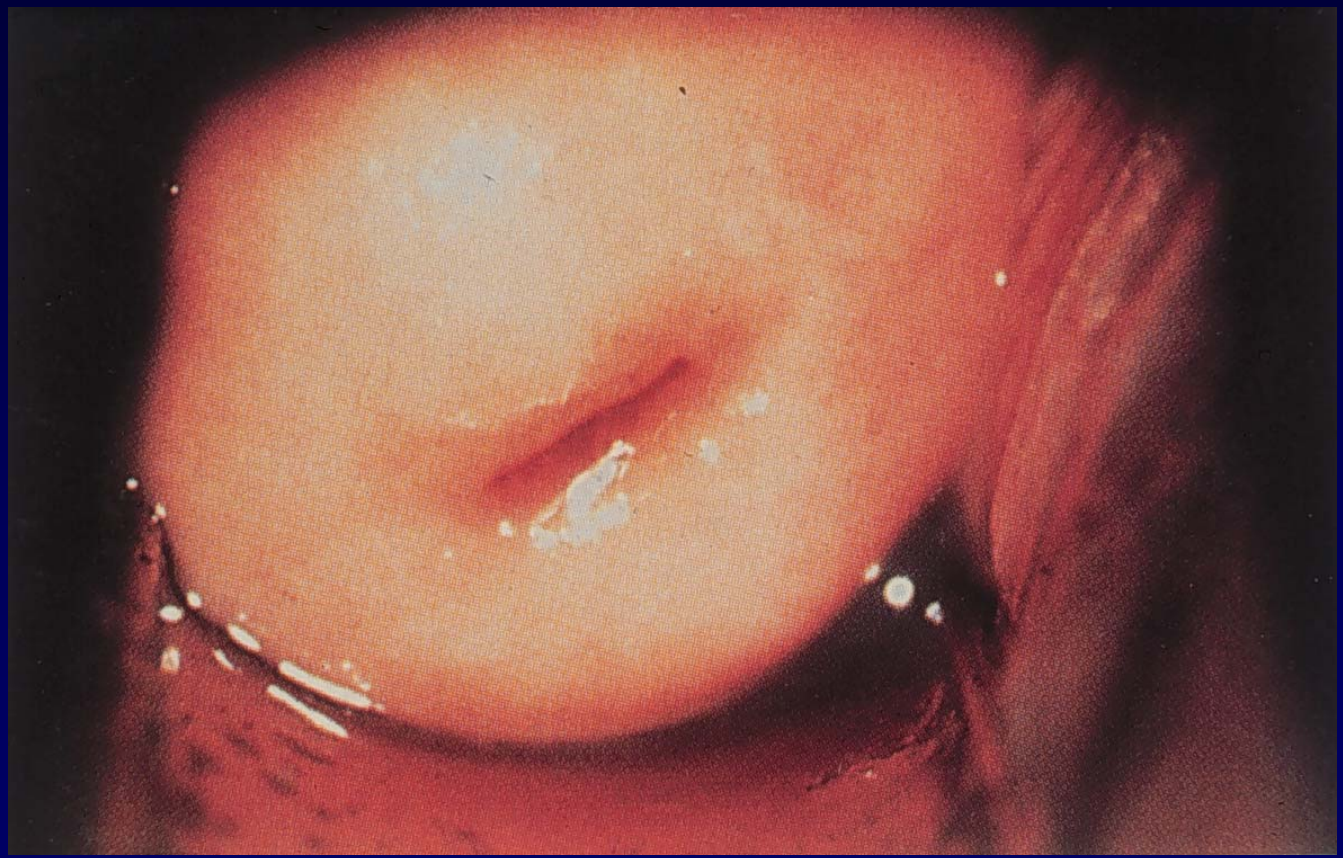
Source: California STD/HIV Prevention Training Center

CDC STD Prevention

Chlamydia trachomatis

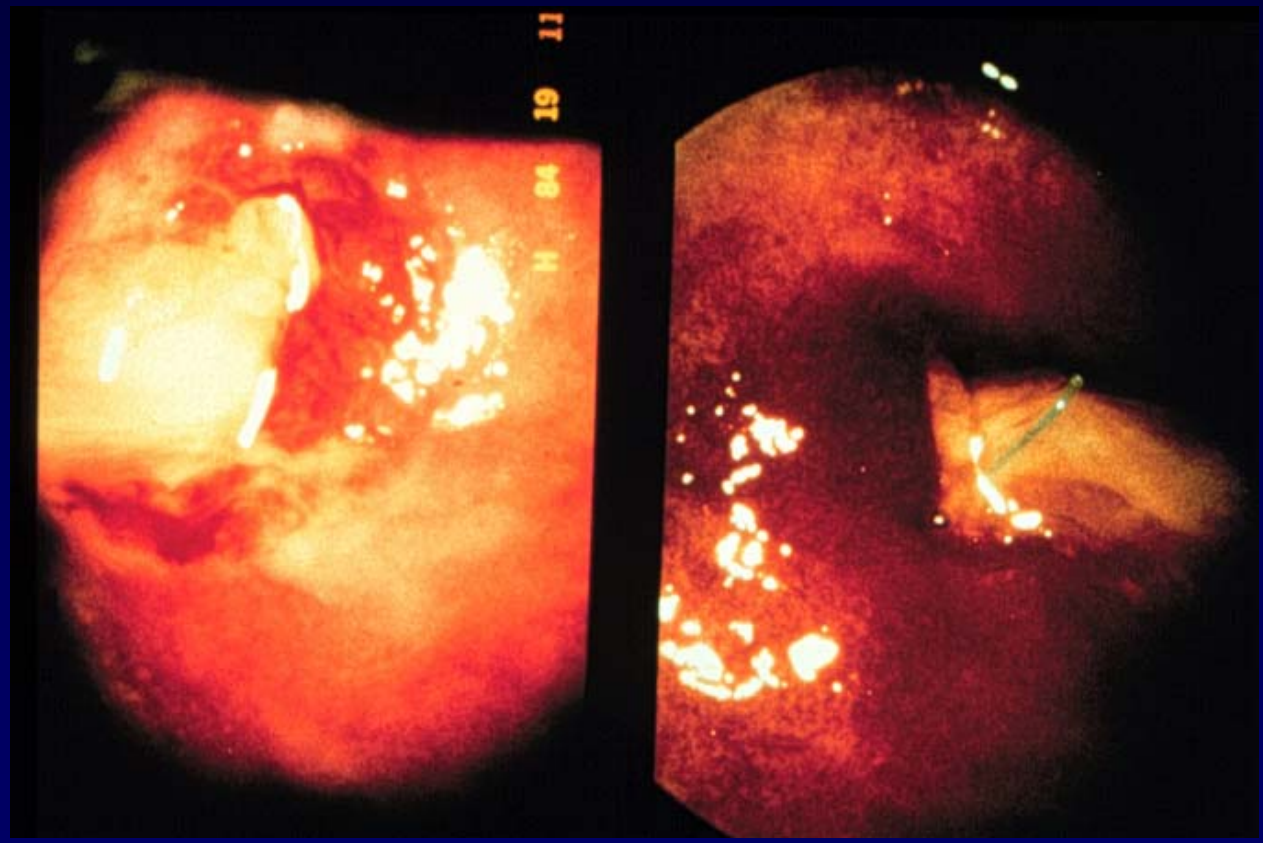
- More than three million new cases annually
- Responsible for causing cervicitis, urethritis, proctitis, lymphogranuloma venereum, and pelvic inflammatory disease
- Direct and indirect cost of chlamydial infections run into billions of dollars
- Potential to transmit to newborn during delivery
  - Conjunctivitis, pneumonia

Normal Cervix



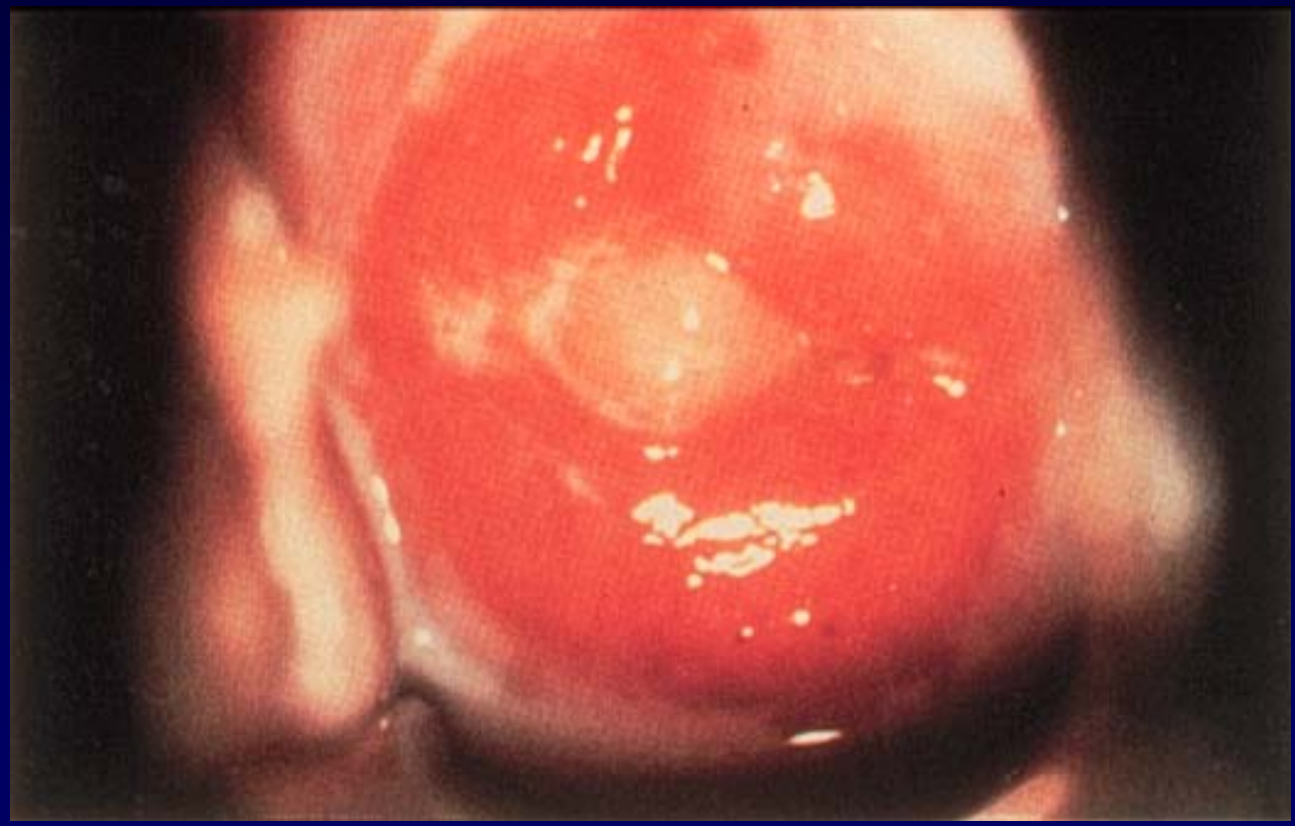
Source: *Claire E. Stevens, Seattle STD/HIV Prevention Training Center*

Chlamydia Cervicitis



Source: St. Louis STD/HIV Prevention Training Center

Mucopurulent Cervicitis



Source: Seattle STD/HIV Prevention Training Center

Laboratory Tests for Chlamydia

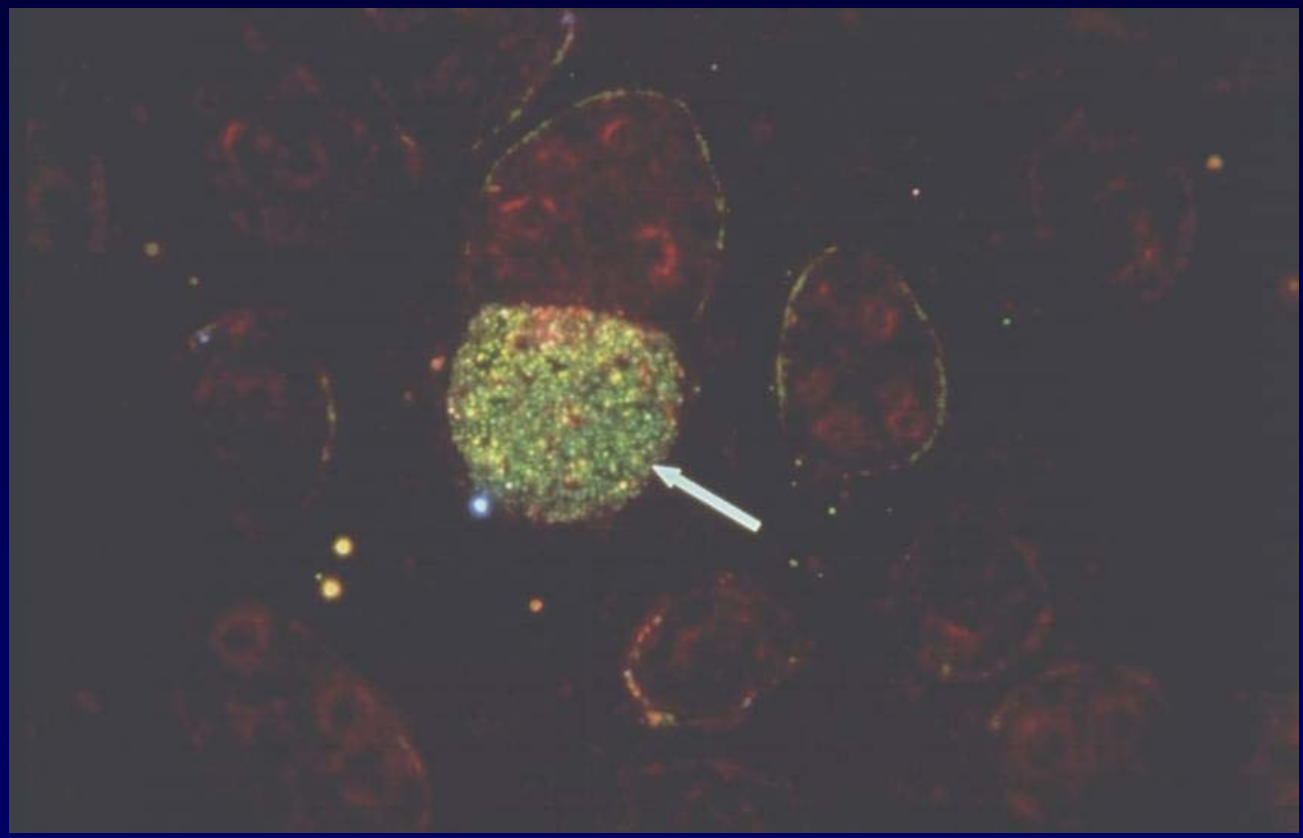
- Tissue culture has been the standard
  - Specificity approaching 100%
  - Sensitivity ranges from 60% to 90%

- Non-amplified tests
  - Enzyme Immunoassay (EIA), e.g. Chlamydiazyme
    - sensitivity and specificity of 85% and 97% respectively
    - useful for high volume screening
    - false positives
  - Nucleic Acid Hybridization (NA Probe), e.g. Gen-Probe Pace-2
    - sensitivities ranging from 75% to 100%; specificities greater than 95%
    - detects chlamydial ribosomal RNA
    - able to detect gonorrhea and chlamydia from one swab
    - need for large amounts of sample DNA

Laboratory Tests for Chlamydia (continued)

- DNA amplification assays
  - polymerase chain reaction (PCR)
  - ligase chain reaction (LCR)
- Sensitivities with PCR and LCR 95% and 85-98% respectively; specificity approaches 100%
- LCR ability to detect chlamydia in first void urine

Chlamydia Direct Fluorescent Antibody (DFA)

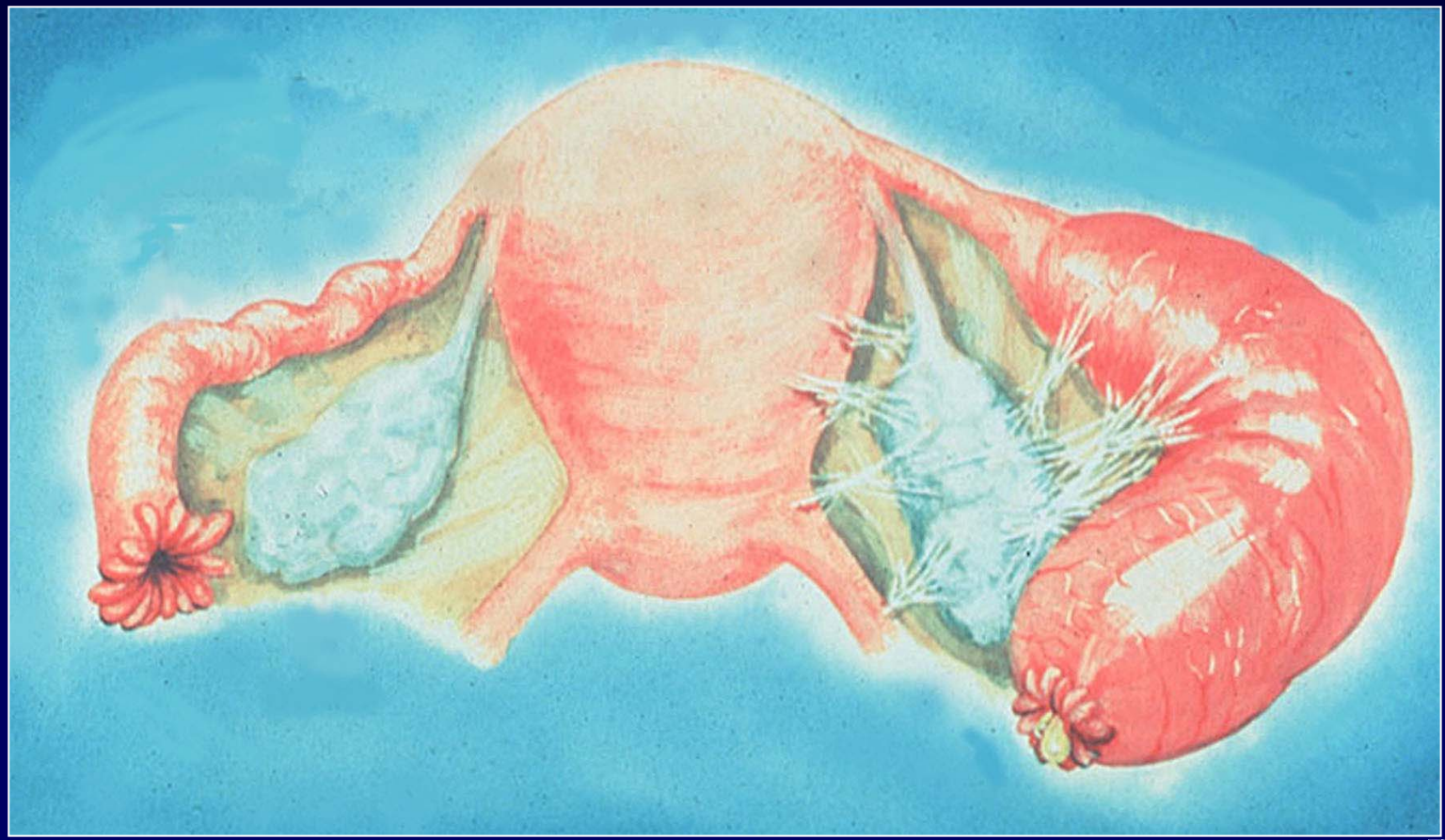


Source: Centers for Disease Control and Prevention

Pelvic Inflammatory Disease (PID)

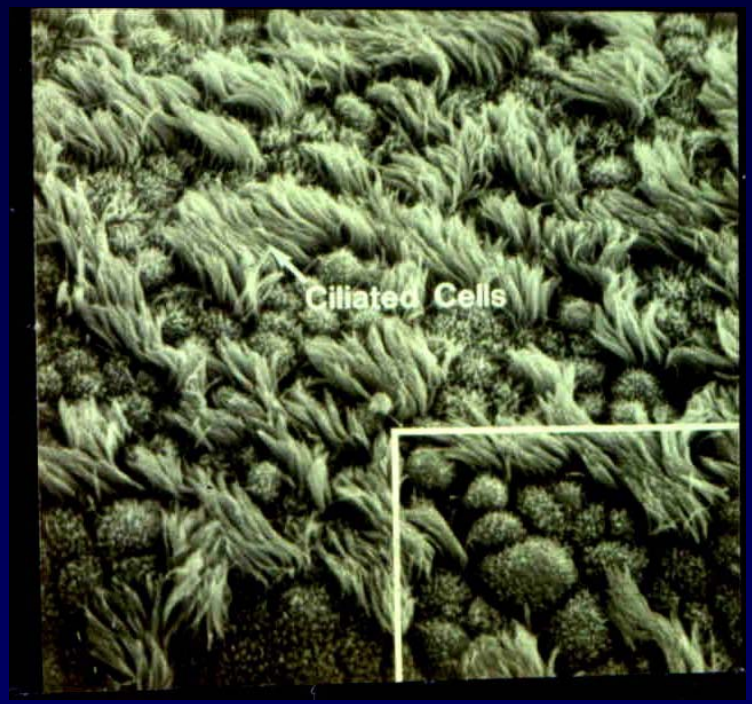
- l0%-20% women with GC develop PID
- In Europe and North America, higher proportion of C. *trachomatis* than *N. gonorrhoeae* in women with symptoms of PID
- CDC minimal criteria
  - uterine adnexal tenderness, cervical motion tenderness
- Other symptoms include
  - endocervical discharge, fever, lower abd. pain
- Complications:
  - Infertility: 15%-24% with 1 episode PID secondary to GC or chlamydia
  - 7X risk of ectopic pregnancy with 1 episode PID
  - chronic pelvic pain in 18%

Pelvic Inflammatory Disease

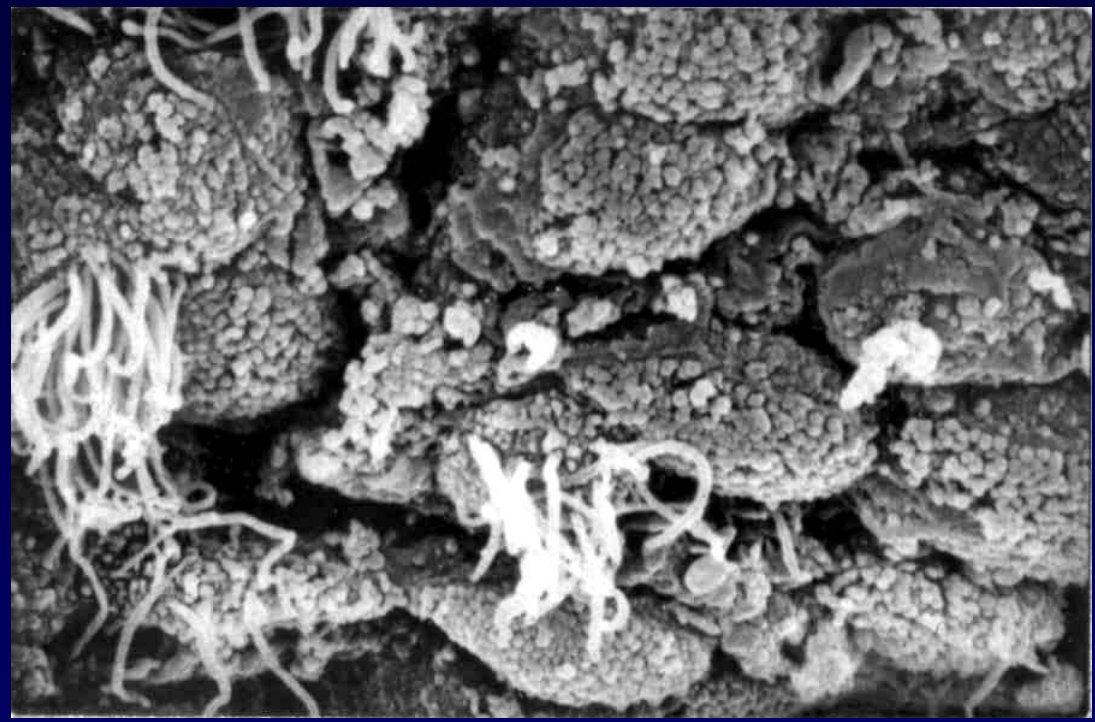


Source: Cincinnati STD/HIV Prevention Training Center

C. trachomatis Infection (PID)



Normal Human
Fallopian Tube Tissue



PID Infection

Source: Patton, D.L. University of Washington, Seattle, Washington

CDC
STD Prevention

HPV and Cervical Cancer

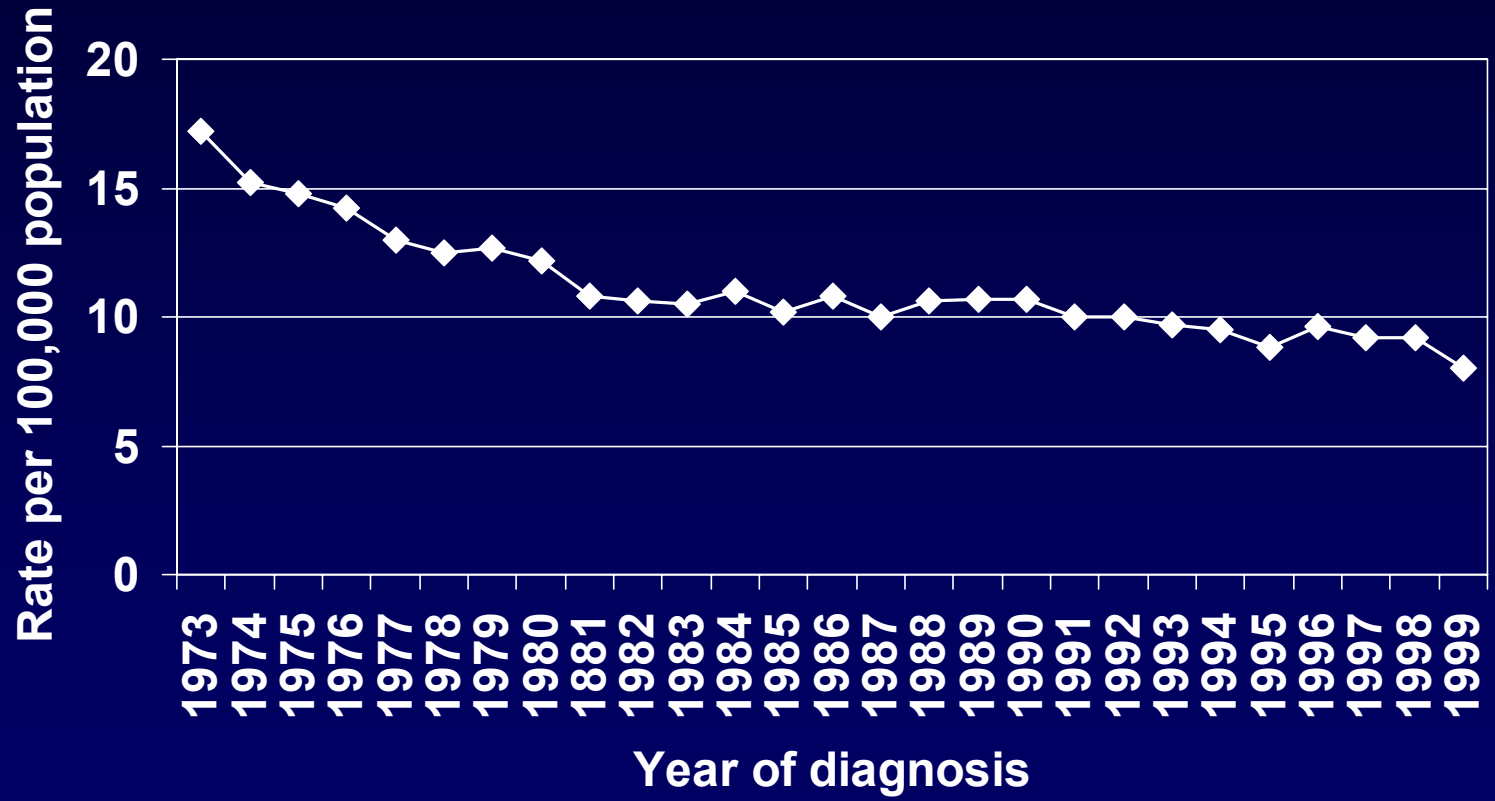
HPV and Cervical Cancer

- Infection is generally indicated by the detection of HPV DNA
- HPV infection is causally associated with cervical cancer and probably other anogenital squamous cell cancers (e.g. anal, penile, vulvar, vaginal)
- Over 99% of cervical cancers have HPV DNA detected within the tumor
- Routine Pap smear screening ensures early detection (and treatment) of pre-cancerous lesions

Estimates for HPV-Associated Cancers

- Cervical cancer:
  - In the U.S., an estimated 14,000 cases and 5,000 deaths
  - Worldwide, an estimated 450,000 cases and 200,000 deaths

Age-Adjusted* Incidence of Cervical Cancer by Year of Diagnosis: U.S. 1973-1999

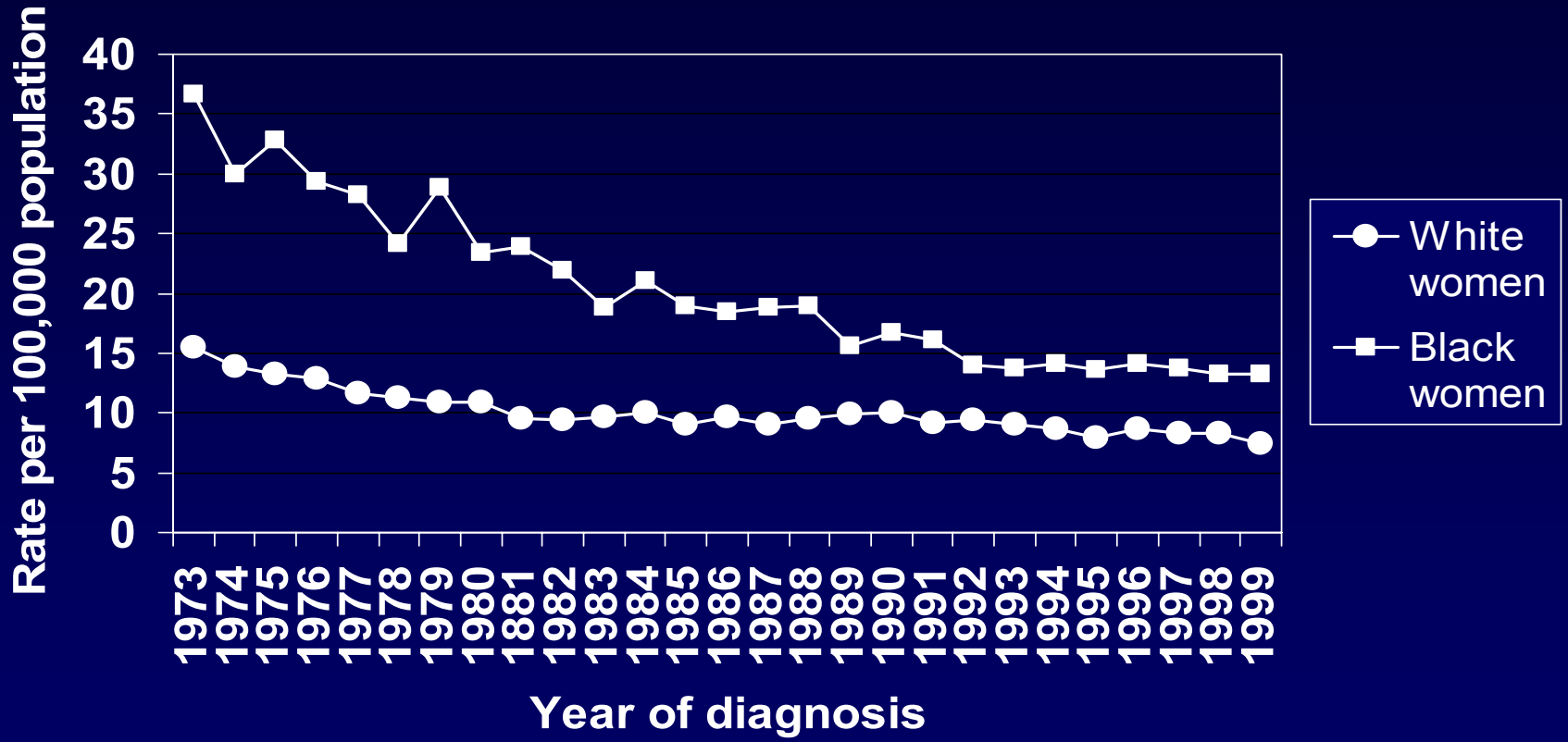


*Age-adjusted to the 2000 US standard population

Source: Ries LAG, Eisner MP, Kosary CL, Hankey BF, Miller BA, Clegg L, Edwards BK (eds). *SEER Cancer Statistics Review, 1973-1999*, National Cancer Institute. Bethesda, MD, http://seer.cancer.gov/csr/1973_1999/, 2002.

CDC STD Prevention

Age-Adjusted* Incidence of Cervical Cancer by Year of Diagnosis and Race: U.S. 1973-1999



*Age-adjusted to the 2000 US standard population

Source: Ries LAG, Eisner MP, Kosary CL, Hankey BF, Miller BA, Clegg L, Edwards BK (eds). *SEER Cancer Statistics Review, 1973-1999*, National Cancer Institute. Bethesda, MD, http://seer.cancer.gov/csr/1973_1999/, 2002.

CDC STD Prevention

Perianal Wart

Source: Cincinnati STD/HIV Prevention Training Center

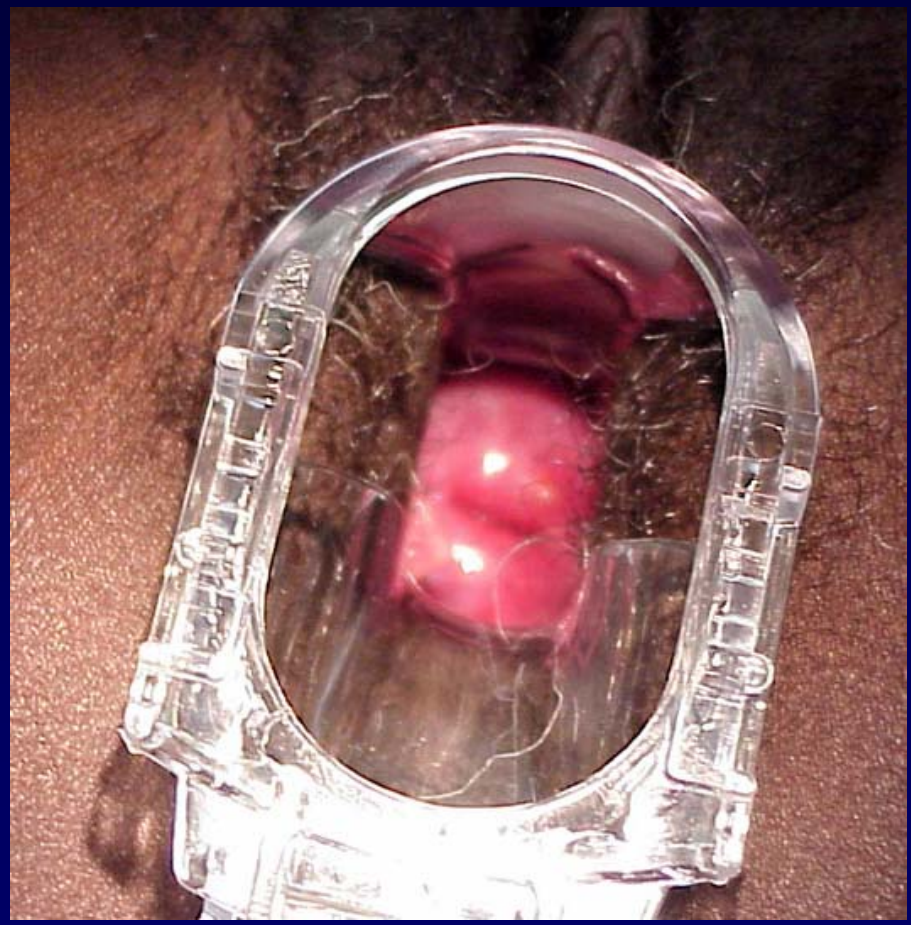
HPV Penile Warts

Source: Cincinnati STD/HIV Prevention Training Center

Intrameatal Wart of the Penis (and Gonorrhea)

Source: Florida STD/HIV Prevention Training Center

HPV Cervical Warts



Source: Cincinnati STD/HIV Prevention Training Center

HPV Warts on the Thigh

Source: Cincinnati STD/HIV Prevention Training Center

Possible HPV on the Tongue

Source: Cincinnati STD/HIV Prevention Training Center

Role of STDs in HIV Transmission

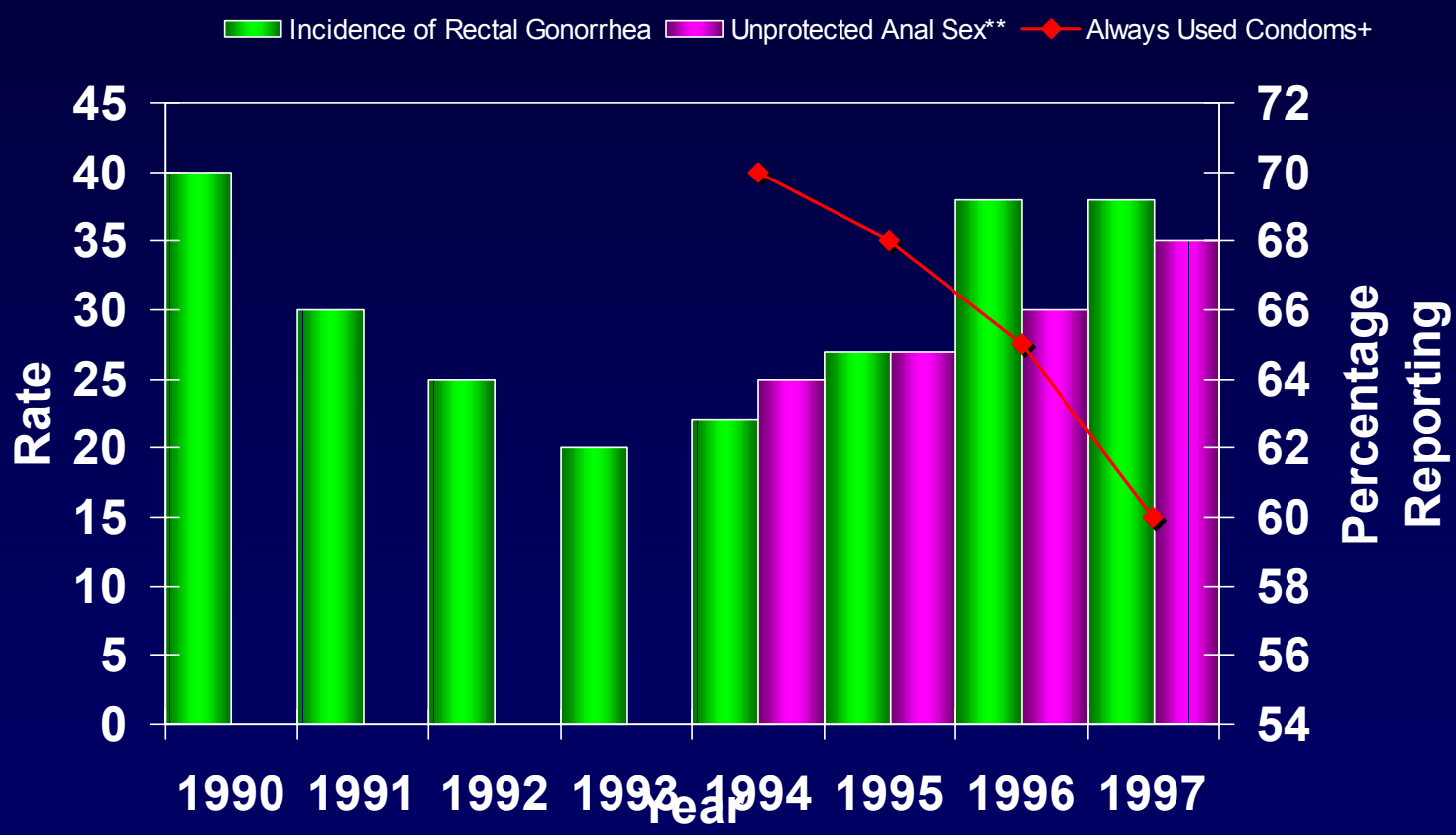
Role of STDs in HIV Transmission Summary

- At least 2 to 5-fold increased risk of HIV seroconversion confirmed by data from 4 continents
- Attributable risk of STDs for HIV transmission substantial in some populations
- HIV susceptibility likely increased through endocervical CD4 recruitment by nonulcerative STDs, as well as through "portal of entry" created by ulcers

Role of STDs in HIV Transmission Summary

- Greater infectiousness because of prevalence & magnitude of HIV shedding increased by STDs; STD treatment reduces shedding to baseline levels
- 40% reduction in HIV incidence achieved in randomized trial of treatment of symptomatic STDs in Tanzania
- No reduction of HIV incidence demonstrated with STD mass treatment every 10 months in randomized trial in Uganda

Percentage of MSM Reporting Selected Sexual Behaviors & Male Rectal Gonorrhea Rates - San Francisco, 1990-1997



*Per 100,000 men aged ≥ 15 years
+Condoms always used during anal sex during the previous 6 months
**Unprotected anal sex with two or more partners during the previous 6 months

Source: MMWR 48:3 1999

CDC STD Prevention

STD Treatment for HIV Prevention in the US - Where Do We Start?

- Access to & quality of STD clinical services
- Early & effective STD-related health care behaviors
- Surveillance systems to monitor STD/HIV trends & interrelationships

STD Treatment for HIV Prevention Access to Quality Clinical Services

- Public & private settings serving HIV-infected or high-risk persons
- Timely access to quality STD diagnosis & treatment for symptomatic people at high risk (e.g., HIV C/T sites, schools, drug treatment centers, jails)
- Training for clinicians & program managers

STD Treatment for HIV Prevention Early, Effective Health Care Behavior

- Sexual risk reduction counseling PLUS…
- Messages for at-risk persons & providers
  - Other STDs increase HIV spread
  - Recognize & act on symptoms/sign
  - Most STDs asymptomatic; regular screening critical
- Specific information on sources of care

STD Treatment for HIV Prevention Linked STD/HIV Surveillance Systems

- Capacity & linkages at local level
- Monitoring of extent of overlap of STD- & HIV-infected populations; relative importance of STD treatment as HIV prevention strategy
- Monitoring of etiological spectrum of STDs
- Timely analysis & dissemination to policy makers, program managers, providers

STD Treatment to Enhance HIV Prevention

- Implementation of Advisory Committee for HIV & STD prevention recommendations [MMWR 1998; 47 (No. RR-12)]
- Augmentation of HIV Community Planning Groups to focus on STD data issues, detection, & treatment in areas with syphilis or GC rates > HP 2010 targets
- Local cross-training for STD & HIV staff in project areas with syphilis or GC rates > HP 2010 targets
- Demonstration projects of on-site STD screening, treatment & related services in setting serving HIV infected & at-risk individuals
- HIV-STD data systems & surveillance linkages
- Evaluation & applied research capacity to answer critical operational questions

"Improved prevention of STDs should be an essential component off a national strategy for preventing sexually transmitted HIV infection."

The Hidden Epidemic: Confronting STDs Institute of Medicine, 1997